

Simulating the effects of sea-level rise on *Zostera marina* production in Padilla Bay, WA

Richard Gwozdz, John Rybczyk, Western Washington University*

Keywords: *Zostera*, model, Padilla Bay, sea-level

Seagrass affects elevation by contributing root and rhizome material to accreting sediments and by trapping sediments on the benthic surface. Current sediment accretion rates in Padilla Bay (WA) seagrass (*Zostera* spp.) beds, however, may not be sufficient to maintain elevation given predicted increases in sea-level rise. A field and modeling study is underway to examine how seagrass may affect sedimentation and respond to sea-level rise in Padilla Bay. We developed a seagrass production model using data and physiological patterns reported for Pacific Northwest *Zostera marina* populations. This deterministic model consists of sub-modules that calculate net primary production, leaf respiration, root respiration, and translocation separately. Hourly measurements of light and temperature, and predictions of tidal height are forcing functions. The model outputs values for above- and belowground biomass. Field measurements of above- and belowground biomass and productivity from Padilla Bay are used to calibrate the model. By modifying temperature and tidal height data, the model can be used to forecast the effect of sea-level rise on Padilla Bay seagrass beds over the next 100 years.